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Studies of the Origins of the Kuroshio and Mindanao Currents with EM-APEX Floats and HPIES

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LONG-TERM GOALS

Improving observations and understanding of major oceanographic features and phenomena. We emphasize motionally induced electric fields for measuring ocean velocities.

APPROACH

The use of bottom-mounted horizontal electric field sensors combined with inverted echo sounder units complements the ADCP moorings in the Kuroshio near the NE tip of Luzon, the Philippines. The new instrument is denoted as HPIES, an abbreviation of Horizontal EF, Pressure and Inverted Echo Sounder. The HEF measures the barotropic horizontal velocity. The pressure and IES data determine baroclinic velocity when operated in a horizontal array. Three complete HPIES exist from the original NSF development support. Two new HPIES are being built using existing PIES and new HEF units.

Five HPIES will be deployed around two upper ocean ADCP moorings by Ren-Chieh Lien. The ADCP is to be moored at 600-m level and upward looking. The HPIES will provide the depth-averaged velocity. Thus, the combination provides both upper ocean Kuroshio transport and total-water transport.

WORK COMPLETED

Preliminary tasks have been to locate and purchase components that are no longer manufactured. There are several key electronic components that had to be located from specialty distributors.

The two new HEF units need to be made. There are expected orders for other projects, such as for the NSF Regional Scale Nodes project. Modifications to the design may be needed to reduce reproduction costs.

PUBLICATIONS (wholly or in part supported by this grant)

Sanford, T. B., J. F. Price and J. B. Girton (2010). Upper ocean response to Hurricane Frances (2004) observed by profiling EM-APEX floats, *J. Phys. Oceanogr.* (in press)

HONORS/AWARDS/PRIZES

Awarded The Henry M. Stommel Research Award from the American Meteorological Society, January 2010

Elected Fellow of the American Meteorological Society, January 2010